

**PIEZO-BASED ENCODER WITH MAGNETIC BRAKE FOR POWERED  
WINDOW COVERING**

**ABSTRACT OF THE DISCLOSURE**

The position and speed and, in some embodiments, direction of rotation of a motor for turning the rod of an object such as a window covering is determined by placing a braking magnet next to the motor and a piezoelectric element between the braking magnet and motor. As the motor rotates, the piezoelectric element generates a signal that can be used to determine the speed of rotation and also the position of the motor (and, hence, the position of the object being moved). The magnet brakes the motor from turning under the weight of the object when the motor is deenergized.